UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

Managing White-Tailed Deer Damage Through Population Reduction in [redacted], South Carolina

Environmental Assessment

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INTRODUCTION

The U.S. Department of Agriculture (USDA) is authorized by law to help alleviate problems created when wild animals cause damage to agriculture, urban or natural resources or present a threat to public health or safety. The primary authority for the Wildlife Services program (WS) is the Animal Damage Control Act of March 2, 1931, as amended (46 Stat. 1468; 7 USC 426-426c) and the Rural Development, Agriculture and Related Agencies Appropriations Act of 1988 (P.L. 100-202). WS activities are conducted in cooperation with other Federal, State, and local agencies and private organizations and individuals.

Wildlife damage management, or control, is defined as the alleviation of damage or other conflicts caused by or related to the presence of wildlife. It is an integral component of wildlife management (Leopold 1933, The Wildlife Society 1990, Berryman 1991). An Integrated Wildlife Damage Management approach (sometimes referred to as Integrated Pest Management or IPM) involves a combination of methods used or recommended to reduce wildlife damage. IWDM is described in Chapter 1, (pages 1-7) of the Animal Damage Control Final Environmental Impact Statement (U.S. Dept. Agri. 1995). These methods include the alteration of cultural practices as well as habitat and behavioral modification to prevent damage. The control of wildlife damage may also require that the offending animal(s) be removed or that populations of the offending species be reduced through lethal methods. Potential environmental impacts resulting from the application of various wildlife damage reduction techniques are evaluated in this environmental assessment.

This environmental assessment (EA) documents the analysis of the potential environmental impacts of WS's proposed wildlife damage management activities in [redacted] County, South Carolina. In order to evaluate and determine if there may be any potentially significant or cumulative impacts from the planned damage management program, we have decided to prepare this EA concerning white-tailed deer management at [redacted] County, South Carolina. A notice to prepare an EA was published in September 10, 1999 in the Sun News.

These WS activities will be undertaken in accordance with relevant laws, regulations, policies, orders, and procedures including the Endangered Species Act. Notice of availability of this document is being made consistent with the Agency's NEPA procedures, in order to allow interested parties the opportunity to obtain this document.

PURPOSE AND NEED

South Carolina Wildlife Services was contacted by representatives of [redacted], SC requesting Wildlife Services' assistance in resolving their white-tailed deer conflicts. [redacted] is a [redacted] acre ([redacted] square mile) residential community that is located between [redacted] and [redacted], South Carolina. This community has [redacted] homes. There are three small parks (each less than 1 acre in size) and no permanent contiguous tracts of

undeveloped land within the community. The majority of undeveloped lots are covered in natural vegetation. White-tailed deer (*Odocoileus virginianus*) may reside within these undeveloped lots, with additional deer bedding down in the surrounding marsh and adjacent properties. The [redacted] adjoins [redacted] on the south, and is approximately 500 acres in size with minimal development.

Residents of [redacted] have discussed their concerns about deer conflicts during town meetings for approximately two years. During this time, individuals operating nuisance wildlife control businesses referred to as Nuisance Wildlife Control Operators (NWCO) have contacted the town offering assistance. In September 1998, 100 petitions signed by residents of [redacted] were submitted to the Town Council asking that they take action to alleviate the deer problem. On November 3, 1998, the town passed (by approximately a two thirds majority) a binding referendum to take action and address the growing number of deer conflicts. A NWCO was secured in an attempt to harvest 40 deer during the 1998 hunting season (August 1, 1998 - December 31, 1998). South Carolina law 50-11-355 (Hunting deer near residence) prohibited the NWCO from harvesting any deer during 1998.

Spotlight survey information serves as a population index and allows population estimates to be made (Overton and Davis 1969). In response to a request by [redacted], three spotlight surveys were conducted by Wildlife Services (WS) during July 1999. An average of 17.7 white-tailed deer were observed which indicated a deer population density of approximately 176 deer per square mile. Standard deer survey techniques used in an urban setting may show bias toward higher deer densities. The biological carrying capacity (BCC) of a population is defined as the maximum number of animals that a given area can support without degradation to the animal's health and its environment over an extended period of time. The BCC for this area without development is approximately one deer per 25 acres (25.6 deer per square mile) (C. Ruth, SCDNR, pers. commun.). The actual carrying capacity is probably higher because habitat is improved in the urban setting. While extensive browsing has occurred in [redacted], there is no indication that the herd has exceeded its biological carrying capacity. For the purpose of this EA, the BCC will refer to the deer density under undeveloped conditions. If the population is maintained at the BCC, it will still be viable as determined by the SCDNR.

The white-tailed population in South Carolina is estimated at 1,000,000 with an annual state-wide harvest of approximately 250,000 deer.

Cultural carrying capacity (CCC) is defined as the maximum number of a given species that can coexist compatibly with local human populations (Decker and Purdey 1988). This term is important in urban areas because it defines the sensitivity of a local community to a specific wildlife species. Even low deer densities may exceed the CCC due to land use attitudes and the level of tolerance for damages or other conflicts associated with local deer populations. Certain parameters may influence CCC such as landscape and vegetation impacts, automobile collisions, high tick populations, and the occurrence of zoonosis. The threshold of wildlife damage acceptance is a primary limiting factor in determining the CCC. For any given damage situation,

there will be varying acceptance thresholds by those directly, as well as indirectly, affected by the damage. The overwhelming community demand for deer population reduction, as noted with the passage of the November 1998 referendum indicates that deer conflicts and concerns are community wide. The actions and complaints of residents in [redacted] regarding their expanding deer population demonstrates that the CCC in this community has been exceeded.

The presence of deer creates a desirable image to some current and potential property owners. The opportunity to view nature in a backyard environment may be considered by these individuals as a unique, positive value to home ownership in [redacted]. However, another segment of property owners has a negative view of the high deer density. The succulent nature of many ornamental landscape plants, coupled with high nutrient contents from fertilizers, offers an attractive food source for deer. In addition to browsing pressure, male white-tailed deer damage ornamental trees and shrubs by antler rubbing which results in broken limbs and bark removal. While large trees may survive antler rubbing damage, smaller saplings often die or become scarred to the point that they are not aesthetically acceptable for landscaping. Browsing by deer has destroyed some ornamental shrubs and flowers. The browsing damage is visually evident and aesthetically displeasing to this segment of the population. Many residents report hundreds of dollars of landscaping being damaged or destroyed each year. In response to or in anticipation of browsing damage, some homeowners have installed barriers around their property or individual plants to deter deer damage. Certain types of barriers may not comply with local ordinances, limiting the types of barriers available.

The occurrence of deer-vehicle accidents in South Carolina has increased dramatically between 1975 (592) and 1996 (5,904) (C. Ruth et al. 1996) with many collisions and near misses going unreported. This increase is due in part to increased deer densities, increased number of vehicles on the road, increased use of vehicles, and increased number of miles of roads. [redacted] has a relatively low incident of deer-vehicle accidents, with three reported accidents in the last five years. [redacted] residents have indicated an increase in the number of both reported and unreported deer-vehicle collisions and are concerned that such collisions will continue to increase.

The residents of [redacted] have expressed concern regarding the role ticks play in the transfer of disease to humans. Research has shown a correlation between infected ticks, deer numbers, and Lyme disease cases (Magnarelli et al. 1984). Eighteen cases of Lyme disease were reported in South Carolina during 1995 (S. Long, SC Department of Health and Environmental Control, pers. commun.). The number of reported cases of Lyme disease may reflect a low incident of transmission (Davidson, and Nettles 1997), difficulties diagnosing the disease (Lyme Disease Foundation, pers. commun.), or survey collection methodology (Dr. A. Ross, pers. commun.). Rocky Mountain Spotted Fever (RMSF) is another disease transmitted by ticks. A total of 37 cases of RMSF were reported in South Carolina during 1995 (S. Long, SC Department of Health and Environmental Control, pers. commun.). Although the number of reported cases of Lyme disease and RMSF are low in South Carolina, [redacted] residents are aware of the potential for exposure to these diseases. Three residents of [redacted] have been diagnosed with Lyme disease and two residents have been diagnosed with RMSF ([redacted]

[redacted], pers. Commun.). Although the residents are concerned, there is no conclusive evidence that the disease was contracted within the community. Ehrlichiosis is a recently recognized tick-borne disease. Antibodies have been detected in white-tailed deer (Davidson, and Nettles 1997). Results of deer tested during a herd health check on Hilton Head Island, [redacted] miles [redacted] of [redacted], showed 100% of these animals had been exposed to this disease (C. Ruth, pers. commun.). At least one employee of the [redacted] has contracted ehrlichiosis. The residents of [redacted] are concerned over disease hazards to public health and safety resulting from the high number of deer.

The [redacted] Town Council and homeowners have expressed concern over the potential conflicts and hazards associated with the area's expanding deer population to the South Carolina Department of Natural Resources (SCDNR) and Wildlife Services. At the request of the Town Council, WS and SCDNR met with the Town of [redacted] Deer Committee, to provide information and recommendations on nonlethal and lethal methods of reducing damage that could be considered and, where deemed to be practical, employed by residents. Recommendations, and the proposed action and alternatives discussed below were developed using a thought process known as the Animal Damage Control (ADC) Decision Model which is described in WS's programmatic Environmental Impact Statement (EIS) (USDA 1995).

The [redacted] Deer Management Plan WS met with town officials and provided information and recommendations on nonlethal methods of reducing damage that could be considered and, where deemed to be practical, employed by residents and town officials. Those recommendations and the proposed action and alternatives discussed herein were developed using a thought process known as the ADC Decision Model which is described in WS's programmatic Environmental Impact Statement (EIS) (USDA 1995). The Town of [redacted] Deer Committee developed a Deer Management Plan which was approved by the SCDNR and which has been adopted by the Town. The Plan establishes an Integrated Wildlife Damage Management approach to resolving deer damage problems. This integrated approach aligns with WS philosophy and standard operating procedures for addressing wildlife damage problems and the Plan is incorporated by reference herein. WS's role under the proposed action analyzed in this EA would be to assist directly in meeting one component of the integrated strategy, i.e., to conduct sharpshooting and live trapping and euthanasia to reduce deer numbers. Any of the above actions allowed by the Plan could be conducted by the town independently of any involvement or oversight by WS.

PROPOSED ACTION

The proposed action is to assist the residents of [redacted], South Carolina in meeting their management objective of reducing the number of white-tailed deer by sharpshooting with an option of some live trapping and euthanasia. The population would be reduced to bring the herd size within the CCC as determined by the residents of [redacted]. The status of a local deer herd in relation to CCC will be evaluated through individual complaints or requests for assistance, public meetings, reports of deer-vehicle collisions and near-misses, reports of landscape or

property damage, and cases of deer-related diseases. Individual tolerances to deer-related conflicts vary. If residents indicate satisfaction with a reduction in deer numbers, removal operations may be terminated early. Likewise, if residents' complaints continue after deer are removed, additional deer may be killed. Also, as determined by SCDNR, WS or other qualified individuals, counts would be made as needed to monitor deer densities before and after lethal management operations.

The [redacted] Town Council has decided that deer removal must occur as part of an overall integrated approach to alleviate deer damage problems. Nonlethal components (habitat modification, frightening devices, physical exclusion, chemical repellents, reproductive inhibitors, and population reduction) of the integrated strategy adopted by the [redacted] Town Council and [redacted] Property Owners Association will be applied by individual homeowners to alleviate localized property specific problems.

WS proposes to assist in meeting the population management objective of reducing the number of deer by conducting sharpshooting with an option of live trapping and euthanasia. Sharpshooting and live trapping and euthanasia could occur between August 15 and March 1, as outlined by SCDNR's Urban Deer Management protocol, and would occur during daylight hours or at night using spotlights or night-vision equipment. Firearm shots to the head and neck are the most efficient method for euthanasia of urban deer (Schwartz 1997). Shots from firearms, and arrow guns would be taken from elevated positions in tree stands or in the beds of trucks to cause a downward angle of trajectory so that any projectile that inadvertently misses or passes through targeted deer will hit into the ground or into earthen embankments to minimize the risk of a stray projectile presenting a safety hazard to people, pets, or property. Bait may be used to attract deer to safe sites for shooting and to enhance success and efficiency. Live traps would be placed in areas where deer frequent. These traps would be baited and checked daily. Deer captured in live traps would be euthanized by shooting. WS would only remove deer under a permit from SCDNR which has management authority over deer in the State. Deer carcasses will be transported to a meat processing facility, which would process the venison and turn it over to a charitable organization for distribution to low-income residents. WS makes no claim as to the edibility of carcasses donated. All WS activities would be undertaken in accordance with relevant laws, regulations, policies, orders, and procedures including the Endangered Species Act.

OBJECTIVE

The objective of the proposed action is to remove white-tailed deer from the Town of [redacted] to reduce the number of deer residing in or frequenting the community. The population would be reduced to bring the herd size within the CCC as determined by the residents of [redacted]. The initial number of deer that would be removed is 40. The deer population would be reevaluated annually to determine if the remaining deer are within the CCC. Additional deer may be removed after reevaluation to bring the population into the CCC. Deer would not be removed to a number below the BCC of the project area.

AUTHORITIES

Wildlife Services has the authority to conduct activities to control wildlife that damage horticultural resources and that are considered nuisances or safety hazards to humans under the Animal Damage Control Act of 1931 (46 Stat. 1468; 7 USC 426-426b), and The Rural Development, Agriculture, and Related Agencies Appropriations Act, of 1988 (P.L. 100-202). The SCDNR has authority to manage deer in the State of South Carolina under the Code of Laws of South Carolina Title 50-1-10. State law 50-11-1090 gives the SCDNR the authority during any season of the year to permit the taking of any game animal and prescribe the method by which they can be taken when they become so numerous that they cause excessive damage to crops and property.

RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS

Wildlife Services Programmatic EIS. WS has issued a final Environmental Impact Statement (EIS) (USDA 1995) and Record of Decision on the National APHIS-WS program. This EA is tiered to that EIS. Normally, according to the APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions are categorically excluded (7 CFR 372.5(c), 60 Fed Reg. 6,000-6,003, 1995). WS has decided in this case to prepare this EA to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of cumulative impacts.

DECISION TO BE MADE

Based on the scope of this EA, the decisions to be made are:

> Should WS conduct sharpshooting with the option of live trapping and euthanasia of deer to assist the Town of [redacted], South Carolina in meeting its objectives for deer damage management?
>
> Would the proposed action have significant impacts on the quality of the human environment requiring preparation of and EIS?

ISSUES

From interagency discussions and public input received during meetings held with the [redacted] Deer Committee and from discussions with the [redacted] Town Council, the following issues were determined to be germane to this proposed action:

> Effects on Human Health and Safety. A concern has been expressed that the methods used to remove deer might pose a hazard to people in the area. Another concern is that

the relatively high deer population presents a risk of exposure to Lyme Disease, other tick borne diseases and injuries or death to persons who experience deer-vehicle collisions.

Effects of deer on property. As stated in the Purpose and Need section, a number of property owners are experiencing substantial damage to landscaping because of deer. These people are concerned whether the proposed action or any of the alternatives would reduce such damage to more acceptable levels.

Effects of deer on the environment. In addition to deer damaging landscaping, deer are browsing on native vegetation. An overabundance of deer places excessive browsing pressure on the native vegetation resulting in browse lines.

Effects on aesthetics and affection bonds with deer. Individuals are concerned that the removal of deer will reduce recreational opportunities to interact with deer in areas inside and outside of [redacted]. These human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment.

Effects on the deer population. Individuals are concerned that the removal of deer will have a negative impact on local, regional, and state deer populations. These include the effects on deer populations, species bio-diversity, and recreational opportunities. Individuals are also concerned that the proposed action would completely eradicate the deer population inside and outside of [redacted].

Humaneness of methods used by WS. Some individuals or organizations are concerned about the methods used by WS to conduct lethal management. These people want WS to utilize methods that are humane and minimize pain and suffering of the deer harvested.

Effects of removal methods on nontarget animals and threatened and endangered species. Individuals have indicated an interest in the effects of the proposed action on nontarget animals and T&E species. They are concerned that nontarget animals or T&E species may be destroyed or injured under this proposal.

EXECUTIVE ORDER ON ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires Federal agencies to analyze disproportionately high and adverse environmental effects of proposed actions on minority and low-income populations. WS has analyzed the effects of the proposed action and determined that implementation of any or all of the alternatives would not have adverse human health or environmental impacts on low-income or minority populations. None of the existing problem areas are located near predominately low-income or minority populations. WS would not be responsible for processing or distributing venison from deer taken in this action. That responsibility would rest with [redacted] officials who have agreed to donate the venison to

needy individuals or charitable organizations for distribution to low-income populations in accordance with all State health regulations.

ALTERNATIVES CONSIDERED, INCLUDING THE PROPOSED ACTION

Alternative 1. Removal of deer by sharpshooting and live trapping followed by euthanasia (the Proposed Action). This alternative is the proposed action described above. It is the preferred alternative and is the action requested by the [redacted] Town Council and approved by the SCDNR.

Alternative 2. No Action. This alternative would result in no assistance from WS in reducing deer numbers in [redacted]. The town would still be able to conduct deer removal activities using its own personnel or by hiring an outside entity to conduct the activity.

ALTERNATIVES CONSIDERED BUT NOT IN DETAIL, WITH RATIONAL

Eradication. This alternative would result in the complete eradication of deer from the town limits of [redacted]. It was not considered in detail because WS activities are conducted for the purpose of alleviating wildlife damage or other wildlife problems. No WS activities are conducted to extirpate a native wildlife species. Also, it is currently not an option that the town is willing to consider. Eradication is most likely not desired by most town residents as well.

Requiring Nonlethal Methods Only. This alternative would require that WS implement only nonlethal strategies or methods, or require the town or property owners to implement them without conducting any lethal removal of deer. This alternative was not considered in detail because the town has decided that nonlethal methods are an important component of an overall integrated deer management strategy, but that they are not likely to reduce all types of damage to acceptable levels for reasons presented above. WS agrees with this determination. WS has no authority to require the town or property owners to implement any specific methods or groups of methods.

Trap and relocate deer. This alternative would involve capturing deer alive using cage-type live traps followed by relocation of the captured deer to another area. Although WS can propose and consider this alternative, SCDNR could reject such a proposal. Population reduction achieved through capture and relocation is labor intensive, and would be costly ($273-$2,876/deer) (O'Bryan and McCullough 1985, Bryant and Ishmael 1991). Physiological trauma and deer mortality during capture and transportation would be high and deer mortality after translocation has ranged from 25-89% (Jones and Witham 1990, Mayer et al. 1993). Although translocated deer usually do not return to their location of capture, some do settle in familiar suburban habitats and create nuisance problems for those communities (Bryant and Ishmael 1991). The American Veterinary Medical Association, The National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists opposes relocation of mammals because of the risk of disease transmission (USDA 1993). High mortality rates of translocated deer,

combined with the manner in which many of these animals die, make it difficult to justify translocation as a humane alternative to removal methods (Bryant and Ishmael 1991).

Application of contraceptives to deer. Deer would be sterilized or contraceptives administered to limit the ability of deer to produce offspring. Contraceptive measures for deer can be grouped into four categories: surgical sterilization, oral contraception, hormone implantation, and immunocontraception (the use of contraceptive vaccines). These techniques would require that deer receive either single, multiple, or possibly daily treatment to successfully prevent conception. The use of this method would be subject to approval by Federal and State Agencies. This alternative was not considered in detail because: (1) it would take a number of years of implementation before the deer population would decline, therefore, damage would continue at the present unacceptable levels for a number of years; (2) surgical sterilization would have to be conducted by licensed veterinarians, would therefore be extremely expensive, and has thus been rejected as an alternative by the town; (3) it is difficult to effectively live trap or chemically capture the number of deer that would need to be sterilized in order to effect an eventual decline in the population; (4) no chemical or biological agents for contracepting deer have been approved for use by state and federal regulatory authorities.

Chemical capture and euthanasia of deer. Deer would be captured by darting deer with a sedative. Sedated deer would then be euthanised either chemically or mechanically. Chemicals would be approved by FDA. Mechanical methods could include devices such as a captive bolt gun. Deer that had been subjected to either chemical capture or euthanasia could not be donated to eleemosynary institutions as required by state law.

AFFECTED ENVIRONMENT

The area of the proposed action is within the Town of [redacted], SC. This area has been identified by the Town of [redacted] as the target area for reduction in deer numbers. At present, sharpshooting and trapping are planned to be conducted throughout the town. The [redacted] Property Owners Association owns undeveloped tracts where sharpshooting will be conducted. Along with community property, private property, where landowners have given permission, will be target areas.

ENVIRONMENTAL CONSEQUENCES

The analysis of environmental effects which could be expected from alternative actions takes into account Wildlife Services decision process procedures (U.S. Dept. Agri. 1994) and direction from the applicable APHIS and Wildlife Services Policy and Directives. The environmental effects from each of the alternatives are measured against the issues discussed in the need for action.

Alternative 1. Removal of deer by sharpshooting and live trapping followed by euthanasia (the Proposed Action).

Effects on Human Health and Safety. Deer management conducted at [redacted] (a residential coastal community in Georgia) and [redacted] (a residential community in [redacted], SC) has demonstrated that deer can be safely removed from an urban area by experienced sharpshooters ([redacted]. pers. commun.). Sharpshooting at [redacted] would include carefully controlled daytime and nighttime shooting, spotlighting, shooting from a vehicle, shooting from stationary platforms, and shooting over bait. Sharpshooting would utilize experienced personnel to remove individual animals. The risk of a stray projectile inadvertently striking a member of the public is virtually eliminated by precautionary measures in place as described in the proposed action (shooting at a downward angle from elevated positions, positively identifying target animals before shooting, using firearms that fire a single projectile per shot, restrictions on public access to shooting areas). A formal Risk Assessment in the programmatic EIS determined that no probable risk to the public or to nontarget animals is expected from WS use of firearms (USDA 1995, Appendix P). There is a small risk of injury to personnel who are shooting in the rare event that a malfunction of a firearm occurs (e.g., an obstructed barrel). This risk is minimized by using trained and experienced personnel. A positive effect on human safety and health would be expected from a reduced risk of deer-vehicle collisions, and reduced risk of human exposure to Lyme Disease and other tick borne diseases.

Live trapping followed by euthanasia would be viewed by some people as posing less of a safety hazard to the public because no shooting with firearms would occur. However, handling numerous deer alive in traps could pose a greater hazard of injury to project personnel.

Effects of deer on Property. Positive impacts would be the reduction of damage to landscaping. Browsing and antler rubbing damage to ornamental plants and landscaping would be reduced as would the need to use barriers. Replacement costs of deer damaged trees and plants would be expected to be greatly reduced.

Effects of deer on the environment. Reduction of a local deer population would reduce pressure on natural food resources and allow for regeneration of over browsed vegetation.

Effects on Aesthetics and Human-Affectionate Bonds with Individual Deer Some persons would feel their interests in viewing deer are harmed by this action because deer numbers would be reduced. However, deer would still be present for viewing in the area, although at reduced numbers. Some people who have developed affectionate bonds with individual deer removed by the action would feel sadness and perhaps anger if those particular deer end up being among those removed.

Effects on Deer Populations. Approximately forty deer would be killed by WS under this alternative with the possibility that additional numbers of deer could be killed in the area in the future if determined necessary after a reassessment by the town, and if permitted by

the SCDNR. The effect would be to reduce the number of deer living in or frequenting the Town of [redacted]. Thus, deer would not be eliminated but would continue to be present in the area although at lower numbers. The remaining deer would be expected to reproduce, eventually restoring the population to the current density. WS would not reduce the population to an extent which would result in a density lower than the BCC for this area. WS activities are conducted for the purpose of alleviating wildlife damage or other wildlife problems. No WS activities are conducted to extirpate a species. The WS program operates in accordance with international, national, and state laws and regulations enacted to ensure species maintenance and viability. A declining population of a resident wildlife species does not necessarily equate to a "significant impact" as defined by NEPA if the decline is collectively condoned or desired by the people that live in the affected human population. It is reasonable and proper to rely on the representative form of government within a state as the established mechanism for determining the "collective" desires or endorsements of the people of a state. WS abides by this philosophy and defers to the collective desires of the people of the State of South Carolina by complying with State laws and regulations that govern the take or removal of resident wildlife. This action may have an impact on deer residing within the [redacted] that frequent [redacted]. The removal of deer from [redacted] may encourage deer currently on the [redacted] property to move into an area with lower deer densities. Deer moving from the [redacted] into the town may be harvested.

Impacts from the proposed action would be monitored by WS in coordination with SCDNR, and the residents to determine the effects on the deer population, and whether the objectives have been met.

Humaneness of Methods to be used. The challenge in coping with the humaneness issue is how to achieve the least amount of animal suffering within the limitations imposed by current technology and legal constraints. WS personnel would strive for head and neck shots when shooting deer to achieve quick kills. Experience has shown that head or neck shots result in almost immediate death. AVMA (1993) recognizes this as an accepted method of euthanasia, and most people would view AVMA euthanasia methods as humane. This should minimize the perception of pain and suffering. Some deer may be initially wounded and must be subsequently dispatched. WS personnel are experienced and professional in their use of management methods so that they are as humane as possible. Although live trapping is often perceived as more humane than shooting with firearms, captured deer sometimes experience injuries such as broken legs or contusions if they struggle to escape the trap.

Effects of Removal Methods on Nontarget animals and Threatened and Endangered Species. The method of sharpshooting is virtually 100% selective for target species because shooters will only fire when a target animal has been positively identified. There is perhaps a small risk that a nontarget wild animal such as a cottontail rabbit could be inadvertently struck by a bullet that misses or passes through a targeted deer; however, the

risk is insignificant. Trap design minimizes impacts to nontarget species. The U.S. Fish and Wildlife Service has reviewed the proposed deer reduction program and has concurred that this action is not likely to adversely affect federally listed or proposed endangered and threatened species.

Alternative 2. No Action (by Wildlife Services).

Effects on Human Health and Safety. If WS takes no action, safety risks to the public resulting from the use of firearms by WS would not be a factor. Because the town is likely to conduct or contract sharpshooting in the absence of involvement by WS, safety risks to the public would probably be about the same as under the proposed action. If the town was unable to conduct or contract sharpshooting, then the risk of deer-auto collisions, threat of human injuries, and potential for disease transmission to humans would likely increase as deer numbers increase.

Effects of deer on Property. No action by WS would have no effect on reducing damages to property. Because the town is likely to conduct or contract sharpshooting in the absence of involvement by WS, effects on these resources would probably be about the same as under the proposed action. If the town was unable to conduct or contract sharpshooting, then deer damage would likely increase over current levels as the population continued to increase. The difficulties in establishing and maintaining landscaping would be an undesirable feature of deer overabundance.

Effects of deer on the environment. No action by WS would have no effect on reducing damages to the environment. Because the town is likely to conduct or contract sharpshooting in the absence of involvement by WS, effects on these resources would probably be about the same as under the proposed action. If the town was unable to conduct or contract sharpshooting, then deer damage would likely increase over current levels as the population continued to increase. This action would result in increased browsing and the subsequent impacts on natural vegetation. The lack of natural vegetation would be an undesirable feature of deer overabundance.

Aesthetics and affection bonds with deer. No action by WS would have no effect on aesthetics and affection bonds with deer. If WS takes no action to assist in removing deer in this situation, the town would likely contract with an entity to conduct it. In that case, the impacts on the deer population would be similar to the proposed action. If the town decides it cannot contract sharpshooting, then it is likely that the no action alternative would allow deer populations at [redacted] to continue to grow. Individuals that enjoy seeing deer throughout the community would be afforded more opportunities to view and interact with deer.

Effects on Deer Populations. No action by WS would have no effect the deer population. If WS takes no action to assist in removing deer in this situation, the town would likely

contract with an entity to conduct it. In that case, the impacts on the deer population would be similar to the proposed action. If the town decides it cannot contract sharpshooting, and state law continues to prohibit sport hunting in this area, then it is likely that deer numbers will continue to increase, perhaps to the point that they exceed the biological carrying capacity, at which point the population would likely decline due to starvation and increased disease problems caused by poor nutrition.

Humaneness of Methods to be used. No action by WS would have no effect on humaneness of methods used by others It is assumed that sharpshooters contracted by the town in the absence of WS involvement would also strive for head and neck shots when shooting deer to achieve quick kills. In that case, humaneness would be similar to the proposed action. If they are relatively inexperienced or lack training, body shots (which are a larger, easier-to-hit target) are more likely to be taken which may result in kills that are not as instantaneous as head/neck shots.

Effects on Nontarget Species Including Threatened and Endangered Species. No action by WS would have no effects on nontarget species including threatened and endangered species. As stated previously, if WS takes no action to assist in removing deer in this situation, the town would likely contract an outside entity to conduct it. It is unlikely that the risk to nontargets or T&E species would be significantly greater under this alternative than under the proposed action, if the same precautionary measures employed by WS were followed.

CUMULATIVE IMPACTS

No significant cumulative environmental impacts are expected if Alternative 1 is adopted. Due to the isolated nature of this community, deer removal from this specific location would have no significant impact on the deer population outside of the [redacted] development and the [redacted]. The decision to reduce the deer population is supported by the SCDNR which, as an agency with responsibility for managing deer in the State, maintains complete control over the number of deer to be killed through its permit system. No risk to pubic safety is expected because only trained and experienced sharpshooters will be allowed to participate in shooting, and precautionary procedures have been established to virtually eliminate the chance of a stray projectile endangering members of the public. Although some persons will likely remain opposed to the lethal removal of deer, the analysis in this EA indicates that such removals will not result in significant cumulative adverse impacts on the quality of the human environment.

If, the town does not contract an outside entity to conduct sharpshooting and Alternative 2 is adopted, environmental impacts may occur. An increase in transmission of zoonotic diseases can be expected as well as an increase in deer-vehicle accidents. Increased damage to landscaping would be expected in response to an increase number of deer utilizing [redacted].

SUMMARY OF IMPACTS OF ALTERNATIVES FOR EACH ISSUE

The following table is a comparison of the alternatives and environmental consequences (impacts):

Issues/Impacts	Alt. 1 - WS Sharpshooting / Trap and Euthanasia	Alt. 2 - No Action
Effects on Human Health and Safety	Positive effect from reduced risk of disease and deer-vehicle collisions. No probable risk of human health or safety effects on methods used by WS.	If the town does not contract with WS or an entity to conduct deer removal activities, a possible increase risk of disease and deer-vehicle collisions could be expected.
Effects of Deer on Property	Positive effect from reduced damage to landscaping	If the town does not contract with WS or an entity to conduct deer removal activities, a negative effect could be expected with increased browsing damage.
Effects of Deer on the Environment	Positive effect due to reduction in deer browsing.	If the town does not contract with WS or an entity to conduct deer removal activities, a negative effect could be expected. Browsing damage will continue at current level or increase.
Effects on Aesthetics and Affection Bonds with Deer	Population reduced. Less opportunity to view deer.	If the town does not contract with WS or an entity to conduct deer removal activities the population will continue to grow. Increased viewing opportunities.
Effects on the Deer Population	Removal of deer would decrease competition for food sources. Some deer that move between the [redacted] and [redacted] would be harvested. No effect would be expected on deer in other areas of the state.	If the town does not contract with WS or an entity to conduct deer removal activities, the population will continue to grow. A negative effect could be anticipated as the increase number of deer compete for a limited food source.
Humaneness of Methods Used by WS	Some people will view as inhumane. WS strives for AVMA euthanasia techniques. As humane as possible given current constraints. Some wounding could occur which may be viewed as inhumane. Live capture and euthanasia could be viewed as equally or less humane than shooting.	No effect by WS
Effects of Removal Methods on Nontarget Animals and T&E Species	No effect.	No effect.

PERSONS / AGENCIES CONSULTED

The following individuals and organizations were consulted in preparing this document. Their suggestions and concerns were considered in the analysis of the alternatives considered.

Dr. Robert Warren	University of Georgia Athens
Dr. Greg Yarrow	Clemson University, Clemson, SC
Doug Hall	USDA APHIS WS, Athens, GA
Charles Ruth	SCDNR, Columbia, SC
Pat Wright	South Carolina Department Health and Environmental Quality
Dr. Jerry Gibson	State Epidemiologist
[redacted]	Deer Committee
	Town Council
	Town Council
The Town of [redacted]	

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DECISION
AND
FINDING OF NO SIGNIFICANT IMPACT

Managing White-Tailed Deer Damage Through Population Reduction
in
[redacted], South Carolina

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS), Wildlife Services (WS) program responds to requests for assistance from individuals, organizations and agencies experiencing damage caused by wildlife in South Carolina. WS has prepared an environmental assessment (EA) that analyzes alternatives for managing damage caused by white-tailed deer in [redacted], South Carolina. Ordinarily, according to APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions are categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6000-6003, 1995). An EA was prepared in this case to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of cumulative impacts. The predecisional EA released by WS in December 1999 documented the need for white-tailed deer damage management in [redacted], South Carolina and assessed potential impacts of various alternatives for responding to white-tailed deer damage problems. The EA is tiered to the programmatic Environmental Impact Statement (EIS) for the Wildlife Services Program[1] (USDA 1995).

WS's proposed action was to reduce the number of white-tailed deer by sharpshooting and live trapping and euthanasia in [redacted]. Based on the analysis in the EA, I have determined that there will not be a significant impact, individually or cumulatively, on the quality of the human environment from implementing the proposed action, and that the action does not constitute a major federal action significantly affecting the quality of the human environment.

Public Involvement

A public meeting to discuss the proposed action and alternatives was held on October 14, 1999. Comments received during that meeting were used to develop the issues and alternatives analyzed in the predecisional EA. The predecisional EA was prepared and released to the public for a 30-day comment period. The predecisional EA was sent to all participants who attended the public meeting, and to other interested individuals. No comments were received in response to the predecisional EA.

Major Issues

Several major issues were deemed relevant to the scope of this EA. These issues were consolidated into the following 7 primary issues to be considered in detail:

1. Effects on Human Health and Safety
2. Effects of deer on property
3. Effects of deer on the environment
4. Effects on aesthetics and affection bonds with deer
5. Effects on the deer population
6. Humaneness of methods used by WS
7. Effects of removal methods on nontarget animals and threatened and endangered species

Alternatives Analyzed in Detail

Two potential alternatives were developed to address the issues identified above. Five additional alternatives were considered but not analyzed in detail. A detailed discussion of the anticipated effects of the alternatives on the objectives and issues is described in the EA. The following summary provides a brief description of each alternative and its anticipated impacts.

[1] USDA (U.S. Department of Agriculture), Animal and Plant Health Inspection Service (APHIS), Animal Damage Control (ADC). 1995. Animal Damage Control Program, Final Environmental Impact Statement. Anim. Plant Health Inspection Serv., Anim. Damage Control. Hyattsville, MD. Volume 1, 2 & 3.

Alternative 1. Removal of deer by sharpshooting and live trapping followed by euthanasia. This alternative would have WS use sharpshooting and live trapping followed by euthanasia to bring the herd size within the cultural carrying capacity as determined by the residents of [redacted]. Sharpshooting will be conducted from elevated stands and from vehicles. Live trapping will be conducted from individual properties as well as community property where WS has received permission from land owners. A positive effect can be expected on human health and safety and property damage. Lower deer numbers may reduce browsing, resulting in a positive effect on the environment. There would be less opportunity to view deer under this alternative which may effect individuals who enjoy viewing deer. Deer removal would decrease competition for food sources, which may promote deer movement from the adjoining property. Some people will view killing deer as inhumane, but others may view this alternative more humane than starvation. Threatened and endangered species are not expected to be impacted by this alternative.

Alternative 2. No Federal WS deer management. This alternative would consist of no federal involvement in managing white-tailed deer in the [redacted]. Private individuals would increase their efforts which would mean lethal management would be conducted by persons with less experience and training, and with little oversight or supervision. Effectiveness and selectivity would probably be lower than Alternative 1. Risks to the would probably be greater than Alternative 1. Persons who perceive capture methods used by WS as inhumane would probably view this alternative as more acceptable than Alternative 1; however, animal suffering could actually be greater because lethal methods would be used by less experienced individuals.

Alternatives considered but not analyzed in detail were:

Eradication. This alternative would result in the complete eradication of deer from the town limits of [redacted]. It was not considered in detail because WS activities are conducted for the purpose of alleviating wildlife damage or other wildlife problems. No WS activities are conducted to extirpate a native wildlife species. Also, it is currently not an option that the town is willing to consider. Eradication is most likely not desired by most town residents as well.

Requiring Nonlethal Methods Only. This alternative would require that WS implement only nonlethal strategies or methods, or require the town or property owners to implement them without conducting any lethal removal of deer. This alternative was not considered in detail because the town has decided that nonlethal methods are an important component of an overall integrated deer management strategy, but that they are not likely to reduce all types of damage to acceptable levels for reasons presented above. WS agrees with this determination. WS has no authority to require the town or property owners to implement any specific methods or groups of methods.

Trap and relocate deer. This alternative would involve capturing deer alive using cage-type live traps followed by relocation of the captured deer to another area. Although WS can propose and consider this alternative, SCDNR could reject such a proposal. Population reduction achieved through capture and relocation is labor intensive, and would be costly ($273-$2,876/deer) (O'Bryan and McCullough 1985, Bryant and Ishmael 1991). Physiological trauma and deer mortality during capture and transportation would be high and deer mortality after translocation has ranged from 25-89% (Jones and Witham 1990, Mayer et al. 1993). Although translocated deer usually do not return to their location of capture, some do settle in familiar suburban habitats and create nuisance problems for those communities (Bryant and Ishmael 1991). The American Veterinary Medical Association, The National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists opposes relocation of mammals because of the risk of disease transmission (USDA 1993). High mortality rates of translocated deer, combined with the manner in which many of these animals die, make it difficult to justify translocation as a humane alternative to removal methods (Bryant and Ishmael 1991).

Application of contraceptives to deer. Deer would be sterilized or contraceptives administered to limit the ability of deer to produce offspring. Contraceptive measures for deer can be grouped into four categories: surgical sterilization, oral contraception, hormone implantation, and immunocontraception (the use of contraceptive vaccines). These techniques would require that deer receive either single, multiple, or possibly daily treatment to successfully prevent conception. The use of this method would be

subject to approval by Federal and State Agencies. This alternative was not considered in detail because: (1) it would take a number of years of implementation before the deer population would decline, therefore, damage would continue at the present unacceptable levels for a number of years; (2) surgical sterilization would have to be conducted by licensed veterinarians, would therefore be extremely expensive, and has thus been rejected as an alternative by the town; (3) it is difficult to effectively live trap or chemically capture the number of deer that would need to be sterilized in order to effect an eventual decline in the population; (4) no chemical or biological agents for contracepting deer have been approved for use by state and federal regulatory authorities.

Chemical capture and euthanasia of deer. Deer would be captured by darting deer with a sedative. Sedated deer would then be euthanised either chemically or mechanically. Chemicals would be approved by FDA. Mechanical methods could include devices such as a captive bolt gun. Deer that had been subjected to either chemical capture or euthanasia could not be donated to eleemosynary institutions as required by state law.

The effects of implementing the proposed action, when added to the other past, present, and reasonably foreseeable future actions, will not significantly affect the quality of the human environment. This determination takes into consideration the following factors:

1. Deer Damage Management, as conducted by WS in the State of South Carolina, is not regional or national in scope. The project area is isolated and less than one square mile in size.

2. Based on the analysis documented in the EA, the impacts of the proposed action will not significantly affect public health or safety. The proposed action is expected to result in an indirect beneficial impact on public health and safety by reducing the potential risk of transmission of disease and by potential vehicle hazards. Concern for the effects of WS methods on public safety was addressed in the EA. Risks to the public from WS methods were determined to be low in a formal risk assessment (USDA 1995, Appendix P).

3. The proposed action will not have a significant impact on unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas. Built-in mitigation measures that are part of WS's standard operating procedures and adherence to laws and regulations that govern impacts on the bird sanctuary will assure that significant adverse impacts on the sanctuary are avoided.

4 The effects on the quality of the human environment are not highly controversial. Although there may be opposition to killing deer, this action is not controversial in relation to size, nature, or effects. Based on consultations with the State wildlife management authorities, the proposed action is not likely to cause a controversial disagreement among the appropriate resource professionals.

5. Mitigation measures adopted and/or described as "part of the proposed action" minimize risks to the public, prevent adverse effects on the human environment, and reduce uncertainty and risks. Effects of methods and activities, as proposed, are known and do not involve uncertain or unique risks.

6. The proposed action does not establish a precedent for future actions. This action would not set a precedent for future urban white-tailed deer management that may be implemented or planned within the State. Effects of the proposed action are minor and short-term in nature and similar actions have occurred previously in the State without significant effects.

7. The number of animals that will be taken by WS annually is small in comparison to total populations. Adverse effects on wildlife or established wildlife habitats would be minimal.

8. The EA discussed cumulative effects of WS on target and nontarget species populations and concluded that such impacts were not significant for this or other anticipated actions to be implemented or planned within the State.

9. This action will not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places and will not cause loss or destruction of significant scientific, cultural, or historic resources. Wildlife damage management would not disturb soils or any structures and therefore would not be considered a "Federal undertaking" as defined by the National Historic Preservation Act.

10. The taking of target species in the State is not an irretrievable or irreversible loss of a resource. The environmental consequences chapter of the EA discusses the effects of the proposed action and concludes that WS take of target species is insignificant to overall populations.

11. WS determined that the proposed project would not affect Federally listed threatened or endangered species.

12. The proposed action is consistent with local, state, and federal laws that provide for or restrict WS wildlife damage management. Therefore, WS concludes that this project is in compliance with Federal, State and local laws for environmental protection.

DECISION

I have carefully reviewed the Environmental Assessment (EA) prepared for this proposal, and it is my determination that the proposed action does not constitute a major Federal action and will not significantly affect the quality of the human environment. As such, an environmental impact statement will not be prepared. Therefore, it is my decision to implement the proposed action as described in the EA.

As stated previously herein, no substantive changes to the analysis in the predecision EA were deemed necessary based on public comments received, and the predecision EA is hereby designated as the final EA for this proposal. Additional copies of the EA are available upon request from USDA, APHIS, WS, 400 Northeast Dr. Suite L, Columbia, SC, 29203.

/s/ 1/31/00

Gary E. Larson Date
Eastern Regional Director
USDA-APHIS-WS